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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,792	02/14/2002	Hironori Aoki	542-007-2	6079

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EXAMINER

DUONG, THOI V

ART UNIT PAPER NUMBER

2871

DATE MAILED: 09/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/049,792

Applicant(s)

AOKI, HIRONORI

Examiner

Thoi V Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5, 6, 8-13 and 15-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 6, 8-12 and 15-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This office action is in response to the RCE, Papers Nos. 8, filed July 09, 2003.

Accordingly, claims 6 and 11 were amended, and claims 4, 7, 14 and 19-21 were previously cancelled. Currently, claims 1-3, 5, 6, 8-13 and 15-18 are pending in this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 5, 6, 8-12 and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Dohjo et al. (USPN 6,078366).

As shown in Figs. 1, 3, 5 and 13, Dohjo discloses an array substrate 100 comprising:

a display area (TFT region) in which pixel electrodes 131 are formed,
a scanning line 111 formed of a low resistivity metal (col. 7, lines 16-27), said scanning line being arranged between the pixel electrodes 131,
a signal line 110 formed of a high melting point metal such as Mo, Ta or its alloy (col. 7, lines 28-37), said signal line crossing over the scanning line 111 interposing an insulating layer 115 therebetween,
a terminal 152 to which a scanning signal is applied, and

an extended scanning line 125a for connecting the scanning line 111 with the terminal 152, said extended scanning line being formed only of the same conductive film as for said signal line 110,

wherein the extended scanning line 125a is electrically connected to the scanning line 111 through contact holes 153, 154 at the neighborhood of the display area and electrically connected to the terminal 152 for the scanning signal through contact holes 155, 156 at the neighborhood of the terminal (see Figs. 1 and 3);

wherein the scanning line 111 and the extended scanning line 125a are electrically connected via a conductive film of the same layer 131 as that for the pixel electrode;

wherein liquid crystal 400 is interposed between the array substrate 100 and a counter substrate 200 having a common electrode 231 and a color filter 221;

wherein the extended scanning line 125a is formed in a grid like shape at a region (Base section in Fig. 3) in which the scanning line and the extended scanning line are overlapped within a connecting portion between the scanning line and the extended scanning line; and

where aluminum or aluminum alloy is used for material of the scanning line (col. 7, lines 16-27);

As shown in Figs. 28 and 31, the array substrate further comprises:

an auxiliary capacitance line 113 arranged in parallel to the scanning line 111 (Fig. 28 and col. 23, lines 54-55),

a collected auxiliary capacitance line (dotted line of storage capacitor-line connecting section 190 in Fig. 28) arranged in parallel to the signal line 110 and electrically connected to the auxiliary capacitance line 113,

a terminal to which a common signal is applied (at top left of Fig. 28), and
an extended auxiliary capacitance line 125 for connecting the collected auxiliary capacitance line with the terminal for the common signal (Fig. 31), said extended auxiliary capacitance line being formed only of the same conductive film as for said signal line (col. 23, lines 54-64),

wherein the auxiliary capacitance line 113, the collected auxiliary capacitance line and the scanning line 111 are formed from the conductive film of same layer (col. 23, lines 42-45);

wherein the collected auxiliary capacitance line and the extended scanning line are crossing interposing an insulating layer 117 therebetween (Fig. 31);

wherein the collected auxiliary capacitance line and the extended auxiliary capacitance line are electrically connected via a conductive film 193 of the same layer as that for the pixel electrode (Fig. 31);

wherein the extended auxiliary capacitance line 125 is electrically connected to the collected auxiliary capacitance line at the neighborhood of the display area through a contact hole 192 and electrically connected to the terminal for the common signal through a contact hole 194 at the neighborhood of the terminal; and

wherein the extended auxiliary capacitance line 125 is formed in a grid like shape at a region 190 in which the collected auxiliary capacitance line and the extended

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auxiliary capacitance line are overlapped within a connecting portion between the collected auxiliary capacitance line and the extended auxiliary capacitance line (see Fig. 31).

Dohjo also discloses in another embodiment that the extended scanning line and the pixel electrodes are formed from the conductive film of same layer (col. 5, lines 27-45). Since the extended auxiliary capacitance line is formed at the same layer as the extended scanning line, the extended auxiliary capacitance line and the pixel electrodes are also formed from the conductive film of same layer.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dohjo in view of Sakata et al. (JP 11-284195) for the same reasons set forth in the last office action.

Dohjo discloses an array substrate that is basically the same as that recited in claim 13 except that the material used for the scanning line is not nitridated aluminum or nitridated aluminum alloy. Sakata discloses a process in which impurity constituted of one of N, O, Si and C is added to an upper layer of a scanning line formed of pure aluminum or aluminum alloy to directly provide low contact resistance (paragraph 11). Thus, it would have been obvious to one having ordinary skill in the art at the time the

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invention was made to modify the array substrate of Dohjo with the teaching of Sakata by using partly or wholly nitridated aluminum or partly or wholly nitridated aluminum alloy for the scanning lines so as to obtain a good contact resistance.

Response to Arguments

7. Applicant's arguments filed on June 04, 2003 and July 09, 2003 have been fully considered but they are not persuasive.

Applicant argued that Dohjo does not mention the term "contact resistance", does not teach the melting point at all, and that it is not clear whether Dohjo's structure even has "an extended scanning line" or "auxiliary extended scanning line". The Examiner disagrees with the Applicant's remarks since Dohjo clearly discloses an array substrate comprising an extended scanning line 125a and an extended auxiliary capacitance line 125 formed of the same conductive film as for the signal line 110 (high melting point metal such as Mo, Ta or its alloy, col. 7, lines 28-37), as shown in Figs. 1, 5, 10-13 and 31 (col. 9, line 66 through col. 10, line 2 and col. 23, line 61-64). In addition, the conductive layer 111a formed of low resistivity metal (Al) in Fig. 7 is a part of the scanning line 111, where the extended scanning line 125a is connected to. Thus, Dohjo's structure clearly shows "an extended scanning line" or "auxiliary extended scanning line" and Dohjo really appreciates the nature of the contact resistance problem by suggesting a high melting point metal for the extended scanning line and the extended auxiliary scanning line although Dohjo does not mention the term "contact resistance".

Applicant also argued that Dohjo's element 125a as an upper-layer wiring line section does not function as an extended scanning line because it connects a slant wiring line section 150 instead of a scanning line. The Examiner disagrees with the Applicant's remarks because, as clearly shown in Fig. 3 of Dohjo, the element 125a in slant wiring line section 150 and the element 111a extended from the scanning line 111 are electrically connected together (col. 10, lines 43-53).

Further, Applicant expressed that it is not understood how the extended scanning line 125a, which forms the slant wiring line section 150, can be said to form a "grid-line shape" as recited in claims 17 and 18. According to claims 17 and 18, the extended scanning line is formed in a grid like shape at a region in which the scanning line and the extended scanning line are overlapped within a connecting portion between the scanning line and the extended scanning line. The region can be seen as base section in Fig. 3 and section 190 in Fig. 31 of Dohjo. Outside this region, the slant wiring line section 150 is slanting and non-parallel connecting lines as shown in Figs. 1 and 28. Also, according to Merriam Webster's Collegiate Dictionary, Tenth Edition, one of the definitions of "grid" is "network of conductors for distribution of power"; therefore, grid like shape is not necessary to be parallel.

Furthermore, Applicant argued that the auxiliary capacitance line 113 looks parallel to the signal lines 110, not parallel to the scanning lines 111 as shown in Fig. 1 of Dohjo. The Applicant should refer to Fig. 28 where the auxiliary capacitance line 113 is parallel to the scanning lines 111.

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Furthermore, Applicant argued that the element 125 of Dohjo does not perform a function of an extended auxiliary capacitance line. The Examiner disagrees with the Applicant's remarks since the element 125 has the same structure as claimed, hence, it will perform the same function.

Finally, with respect to claim 13, in response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Sakata's reference is employed for teaching a process in which impurity constituted of one of N, O, Si and C is added to an upper layer of a scanning line formed of pure aluminum or aluminum alloy to directly provide low contact resistance (paragraph 11). Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the array substrate of Dohjo with the teaching of Sakata by using partly or wholly nitridated aluminum or partly or wholly nitridated aluminum alloy for the scanning lines so as to obtain a good contact resistance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (703) 308-

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
3171. The examiner can normally be reached on Monday-Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (703) 305-3492.

Thoi Duong



09/12/2003


ROBERT H. KIM
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